AMENDMENTS

In the abstract:

Micro-fluid devices and methods for their use are provided. The subject devices are characterized by the presence of at least one micro-valve **having** ~~**comprising**~~ a phase reversible material, e.g. a reversible gel, that reversibly changes its physical state in response to an applied stimulus, e.g. a thermoreversible gel. In using the subject device, fluid flow along a flow path of the device is modulated by applying an appropriate stimulus, e.g. changing the temperature, to the microvalve. The subject devices find use in a variety of applications, including micro-analytical applications.

In the claims:

Claims 1-36 (Cancelled).

37. (Currently Amended) A method of modulating fluid flow along a flow path of a micro-fluidic device, said method comprising: modulating the physical state of a micro-valve positioned in said flow path, wherein said micro-valve comprises a phase reversible material **stably associated with said microvalve**.

38. (Original) The method according to claim 37, wherein said phase reversible material is a phase reversible polymer.

39. (Original) The method according to claim 38, wherein said phase reversible polymer is a thermoreversible polymer.

40. (Original) The method according to claim 37, wherein said modulating comprises changing the temperature of said thermoreversible polymer.

41. (Original) The method according to claim 37, wherein said modulating occurs by actuation of a phase reversing means.

42. (Original) The method according to claim 41, wherein said phase reversing means is completely external to said device.

43. (Original) The method according to claim 41, wherein at least one component of said phase reversing means is internal to said device.

Claims 44 -45 (Cancelled)

Please add the following new claims:

46. (New) The method according to claim 37, wherein said phase reversible material goes from a first permeable state to a second impermeable state.

47. (New) The method according to claim 37, wherein said device comprises two intersecting flow paths, wherein one of said flow paths is substantially filled with said phase reversible material and said micro-valve is positioned at the intersection of said intersecting flow paths.

48. (New) The method according to claim 37, wherein said micro-valve comprises said phase reversible material stably associated with a high surface area component.

49. (New) The method according to claim 48, wherein said high surface area component is stably associated with at least one wall of said fluid flow path.

50. (New) The method according to claim 48, wherein said high surface area component is maintained in said flow path by a retaining means.

51. (New) The method according to claim 48, wherein said high surface area component comprises an array of posts bonded to said at least one surface of said flow path.

52. (New) The method according to claim 37, wherein said micro-fluidic device comprises at least one micro-compartment.

53. (New) The method according to claim 52, wherein said micro-compartment is a micro-channel.

54. (New) The method according to claim 38, wherein said phase reversible polymer is an N-isopropylacrylamide copolymer.

55. (New) The method according to claim 38, wherein said phase reversible polymer is a polyalkylene oxide.

56. (New) A method of modulating fluid flow along a flow path of a micro-fluidic device, said method comprising: modulating the physical state of a micro-valve positioned in said flow path, wherein said micro-valve comprises a phase reversible material stably associated with said microvalve and said phase reversible material goes from a first permeable state to a second impermeable state.

57. (New) The method according to claim 56, wherein said phase reversible material is a phase reversible polymer.

58. (New) The method according to claim 57, wherein said phase reversible polymer is a thermoreversible polymer.

59 (New) The method according to claim 57, wherein said phase reversible polymer is an N-isopropylacrylamide copolymer.

60 (New) The method according to claim 57, wherein said phase reversible polymer is a polyalkylene oxide.

61. (New) The method according to claim 57, wherein said modulating comprises changing the temperature of said thermoreversible polymer.

62. (New) The method according to claim 57, wherein said modulating occurs by actuation of a phase reversing means.

63. (New) The method according to claim 62, wherein said phase reversing means is completely external to said device.

64. (New) The method according to claim 62, wherein at least one component of said phase reversing means is internal to said device.

65. (New) The method according to claim 57, wherein said device comprises two intersecting flow paths, wherein one of said flow paths is substantially filled with said phase reversible material and said micro-valve is positioned at the intersection of said intersecting flow paths.

67. (New) The method according to claim 57, wherein said micro-valve comprises said phase reversible material stably associated with a high surface area component.

68. (New) The method according to claim 67, wherein said high surface area component is stably associated with at least one wall of said fluid flow path.

69. (New) The method according to claim 67, wherein said high surface area component is maintained in said flow path by a retaining means.

70. (New) The method according to claim 67, wherein said high surface area component comprises an array of posts bonded to said at least one surface of said flow path.

71. (New) The method according to claim 57, wherein said micro-fluidic device comprises at least one micro-compartment.

72. (New) The method according to claim 71, wherein said micro-compartment is a micro-channel.